

SHOCK ABSORBING MOTOR MOUNT FOR VIBRATORY BELT DRIVE

This invention relates to pivoting motor mounts, and more specifically to those provided with spring bias for tensioning drive belts or bands that operate vibratory apparatus.

BACKGROUND OF THE INVENTION

Heavy-duty apparatus such as vibratory conveyor belts, chain hoists, and the like that have an intermittent load are often driven by power bands or drive belts from an electric motor. Tension on the band is maintained by supporting the motor on a pivoting motor mount. A platform holds the motor. An elongate sleeve affixed to the underside of the platform pivots on a stationary axle mounted on a fixed base. A non-cylindrical resilient member between the sleeve and the axle provides spring bias. In another type of mount, spring bias is provided by a compression spring between the pivoting axle and the base. When the load on the apparatus is excessive, such as at start up, the band slips. This causes excessive band wear, leading to early band failure. The cost to the operation is more than just the band cost. In many cases the cost to lost use of the apparatus during band replacement is many fold greater, since maintenance personnel may not be at hand. Then the entire operation may be stopped for days.

SUMMARY OF THE INVENTION

It is accordingly an object of the invention to provide an improved spring tension means for a pivoting motor mount that will prevent premature failure of the power bands.

It is another object that the improved tension means of the invention be readily adapted to retrofit existing pivoting motor mounts.

It is yet another object that the tension means of the invention be readily adjustable to suit a particular application.

It is yet another object that the tension means of the invention facilitate the replacement of the power bands when necessary.

These and other objects, features, and advantages of the invention will become more apparent when the detailed description is studied in conjunction with the drawings in which like elements are designated by like reference characters in the various drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagrammatic representation of a motor mount of the prior art.

Fig. 2 is a diagrammatic representation of another motor mount of the prior art.

Fig. 3 is a diagrammatic representation of a motor mount of the invention.

Fig. 4 is a diagrammatic representation of an assembly of the invention for retrofitting an existing pivoting motor mount.

Fig. 5 is a diagrammatic representation of another embodiment of the invention.

Fig. 6 is a diagrammatic representation of another embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to Fig. 1, a pivoting motor mount in common use has a platform 4' upon which an electric motor is bolted. The platform is supported on a base 9' by a non-round bar 62 attached to the base. A rubber sleeve 61 is attached to the platform by clamps 67. When the motor is used to drive an endless belt that produces vibration, such as a conveyor belt in a cement plant, the platform can pivot to a limited extent with spring bias provided by the rubber sleeve. This provides sufficient tension to the belt to prevent slipping during continuous operation. However, at start-up the belt may slip enough to shorten the life of the belt considerably. This is costly to operations.

Fig. 2 illustrates another pivoting motor mount of the prior art. The platform 4'' is affixed to axle 63 by sleeve blocks 66. Axle 63 is rotatably supported on base 9'' by bearings 68. Torque arm 65 affixed to the axle cooperates with spring 64 to provide spring bias against platform rotation. Applicants have found this structure to suffer the same deficiencies as that of Fig. 1.

Referring now to Fig. 3, a pivoting motor mount 6 of the invention comprises a pivoting platform 4 for attaching a motor 1 with a motor shaft 2 that drives an endless belt 3. An elongate cylindrical sleeve 7 is affixed to the underside 5 of platform 4. The sleeve 7 pivots about axle 10 that is affixed to a base 9 that is mounted on a support of the machinery (not shown). Means facilitating rotation about the axle may be provided such as a sleeve bearing, or the grease fitting 11 shown. Spring bias on the belt is provided by compression coil spring assembly 24, which springably resists rotation of the platform about the axle. One blade 23 of the spring assembly 24 is affixed to the base 9 by attachment 13. A second blade 22 of the assembly 24 is attached to a turnbuckle 21 that is attached by connector 14 to the edge of the platform. The turnbuckle may be adjusted to pull blade 22 out and compress spring 12 until the correct spring bias is applied to

the belt to overcome slipping on start-up. Non-metallic bearing material 15 such as nylon may be provided to prevent metal-to-metal friction between the two blades. Applicants have found this configuration to greatly increase belt life with a considerable economic benefit both in belt replacement costs and lost productivity costs.

Referring now to Fig. 4, another embodiment of the invention is shown in which the system of the invention may be retrofitted onto an existing motor mount. The spring assembly 24 is attached to the front end of the platform 44 by a hook 26 attached to a chain 25 that passes over the motor 1.

Referring now to Fig. 5, another embodiment of the invention is shown in which the spring bias is provided by a leaf spring 16 attached to the platform 4' by a shackle 17. The free end 18 of the spring slidingly engages the base 9' to springably resist rotation of the axle 2' fixed to the platform about the bearings 27 affixed to the base. The spring bias is applied to the base and the platform at a distance of at least 20 centimeters from the axis of rotation that is the center of the axle.

Referring now to Fig. 6, another embodiment of the invention is shown in which the spring bias is provided by a leaf spring 16' attached to the base 9'' by a shackle 19. The free end 20 of the spring slidingly engages the platform 4'' to springably resist rotation of the axle 2'' fixed to the platform about the bearings 27' affixed to the base.

All of the above disclosed embodiments apply spring bias between the platform and the base away from the pivotal connecting means between the platform and the base. They provide sufficient movement to enable the platform to be forced forward far enough that the belt may be replaced without disconnection or readjustment.

While we have shown and described the preferred embodiments of my invention, it will be understood that the invention may be embodied otherwise than as herein specifically illustrated or described, and that certain changes in form and arrangement of parts and the specific manner of practicing the invention may be made within the underlying idea or principles of the invention.